

**Startup Creek**  
**Pipeline MP 64.77**  
**ADF&G Stream No. N/A**  
**Site Visit: 8/16/05**

Crossing Description: Startup Creek is a low-gradient creek with a maximum observed width of approximately four feet. General topography both ahead and back of the crossing is considered to be flat. Total observed relief between the creek level and surrounding topography is approximately 10 feet.

Soils Description: Soils observed in creek banks and surrounding topography consisted of organic-rich brown silt. Observed soils within the creek bed consisted of gravels containing cobbles; however these coarse-grained soils are interpreted to be a thin armor layer. Maximum observed cobble size was less than 12 inches.

Bedrock Description: Depth to bedrock is unknown; however surficial deposits are anticipated to be greater than 25 feet in depth within the immediate area of the crossing. Vegetation cover precluded any aerial observation of the stream bed and banks for bedrock exposures.



Looking cross-stream toward the west and Gunsight Mountain.



Looking downstream



**Caribou Creek**  
**Pipeline MP 75.68**  
**ADF&G Stream No. 247-50-10220-2341**  
**Site Visit: 8/16/05 & 9/2/05**

Crossing Description: In the vicinity of the pipeline crossing, Caribou Creek is a moderate gradient stream with a braided channel. The floodplain is fairly wide in some areas however in the vicinity of the crossing, the floodplain appears to pinch out due to more resistant deposits on both the left and right stream banks. Discharge is anticipated to be highly variable.

Soils Description: Floodplain and floodplain terrace deposits consisting of silty gravels with sand containing cobbles and boulder to gravels with silt and sand containing cobbles and boulders were observed within and alongside the creek channel. Surface conditions indicate permafrost may be absent at this crossing.

Bedrock Description: Bedrock exposures were observed in the immediate vicinity of the proposed crossing. Bedrock is mapped as the Matanuska formation (shale, siltstone, sandstone, and conglomerates). Anecdotal evidence obtained from a local miner indicates that typical bedrock depth within the stream channel may be as shallow as two to three feet.



Approximate location of proposed Caribou Creek crossing, looking upstream.



Black line indicates approximate location of proposed crossing, looking upstream.

**Soils Studies**

Prepared by: **R&M**  
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**Natural Gas Pipeline**  
**FIELD SITE DESCRIPTION**  
**Glennallen to Palmer Spur Line**



**Chickaloon River**  
**Pipeline MP 110.5**  
**ADF&G Stream No. 247-50-10220-2171**  
**Site Visit: 8/16/05**

Crossing Description: Chickaloon River is a high-gradient stream with a straight river channel in the vicinity of the proposed crossing. Right (west) bank topography is relatively gentle while topography on the left (east) bank of the crossing is extremely steep. A slope of approximately 140 feet in height was observed rising directly from the stream bed.

Soils Description: Right (west) bank soils and stream bed soils are interpreted as being floodplain and floodplain terrace deposits consisting of rounded cobbles and boulders, gravel, and sand, both sorted and layered. Soils are considered to be unfrozen, with good drainage. Permafrost is not anticipated at this crossing location.

Bedrock Description: Left (east) bank bedrock generally consists of mudstone, siltstone, and conglomeratic sandstone. No bedrock was observed on the right (west) bank of the proposed crossing.



Left (east) bank weathered bedrock slope of Chickaloon River.  
Looking slightly downstream from right (west) bank.



Right (west) bank floodplain deposits, looking downstream.

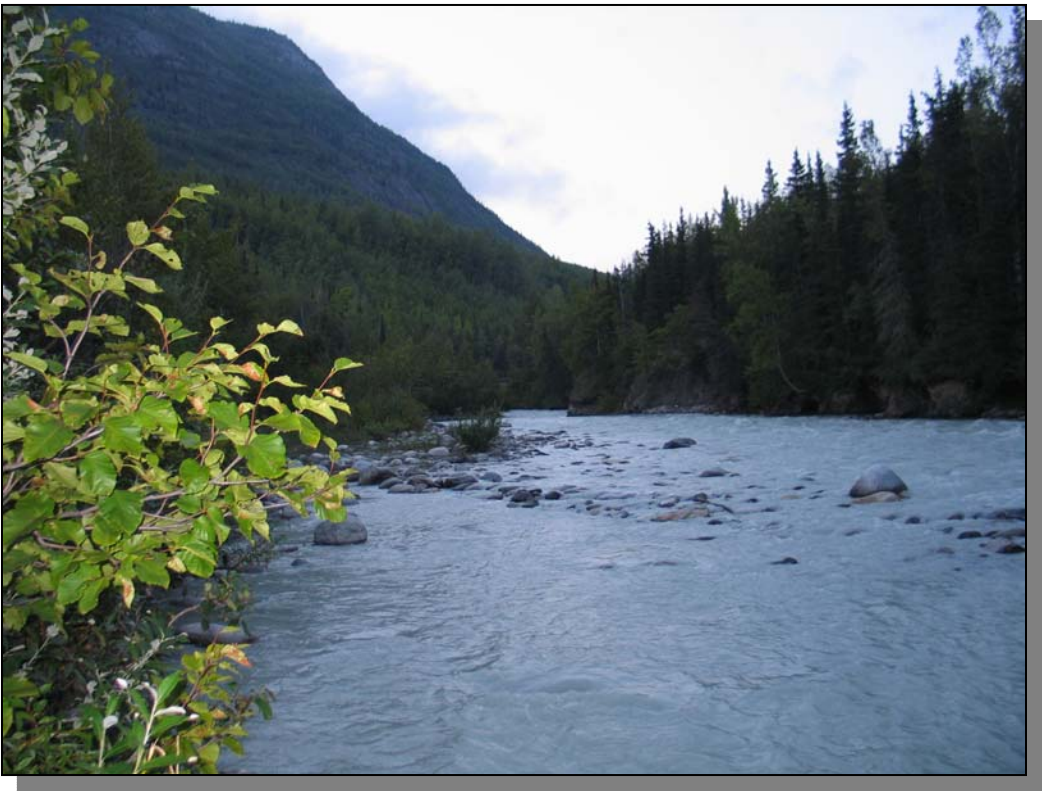


**Kings River**  
**Pipeline MP 117.94**  
**ADF&G Stream No. 247-50-10220-2115**  
**Site Visit: 8/15/05**

Crossing Description: In the vicinity of the proposed pipeline crossing, Kings River has a straight river channel with a fairly high gradient. Discharge is anticipated to be highly variable.

Soils Description: Floodplain and floodplain terrace deposits consisting of silty gravels with sand containing cobbles and boulders to gravels with silt and sand containing cobbles and boulders were observed within and alongside the river channel. Permafrost is not anticipated at this crossing location.

Bedrock Description: Bedrock exposures were observed immediately adjacent to the east and west bank floodplain and floodplain terrace deposits. Depth to bedrock within the stream channel may be fairly shallow.



Right (west) bank floodplain deposits and east bank bedrock outcrops, looking upstream.



Riverbed floodplain deposits, looking across from the west bank.

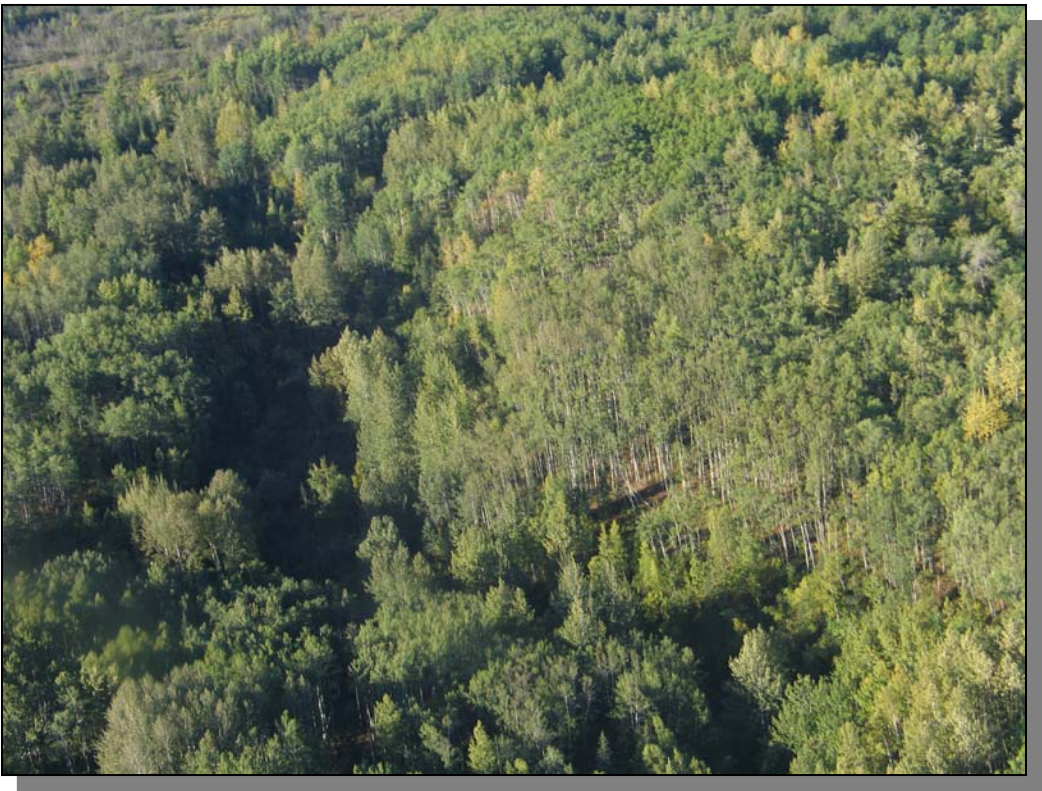


**Little Granite Creek**  
**Pipeline MP 124.29**  
**ADF&G Stream No. 247-50-10220-2341**  
**Site Visit: 9/2/05**

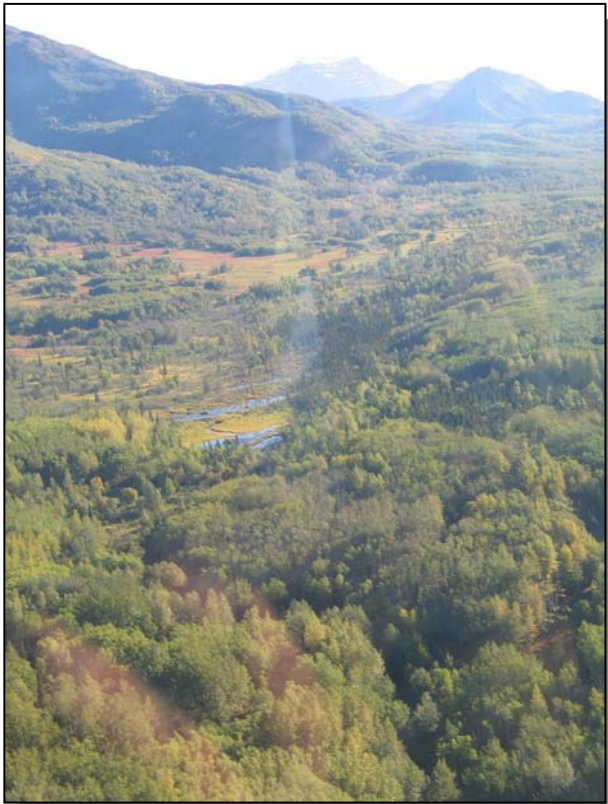
Crossing Description: In the vicinity of the pipeline crossing, vegetation was dense. Therefore, observation of the stream bed was obscured. General topography indicates a high-gradient stream with straight stream bed channel. Relief on both banks appears fairly abrupt. The stream bed is located in a small V-shaped valley.

Soils Description: Terrain unit mapping indicates that soils in the immediate area of the crossing consist of glacial till overlying bedrock. This glacial till consists of gravelly silty sand and gravelly sandy silt with cobbles and boulders, subrounded to subangular striated cobbles; faint layering; and unsorted. Permafrost is not anticipated at this crossing.

Bedrock Description: Depth to bedrock is unknown, and vegetation cover precluded the observation of the stream bed and banks for bedrock exposures.



Looking downstream from directly above the approximate location of the proposed crossing.



Looking east along pipeline alignment from directly above Little Granite Creek crossing.

*Soils Studies*

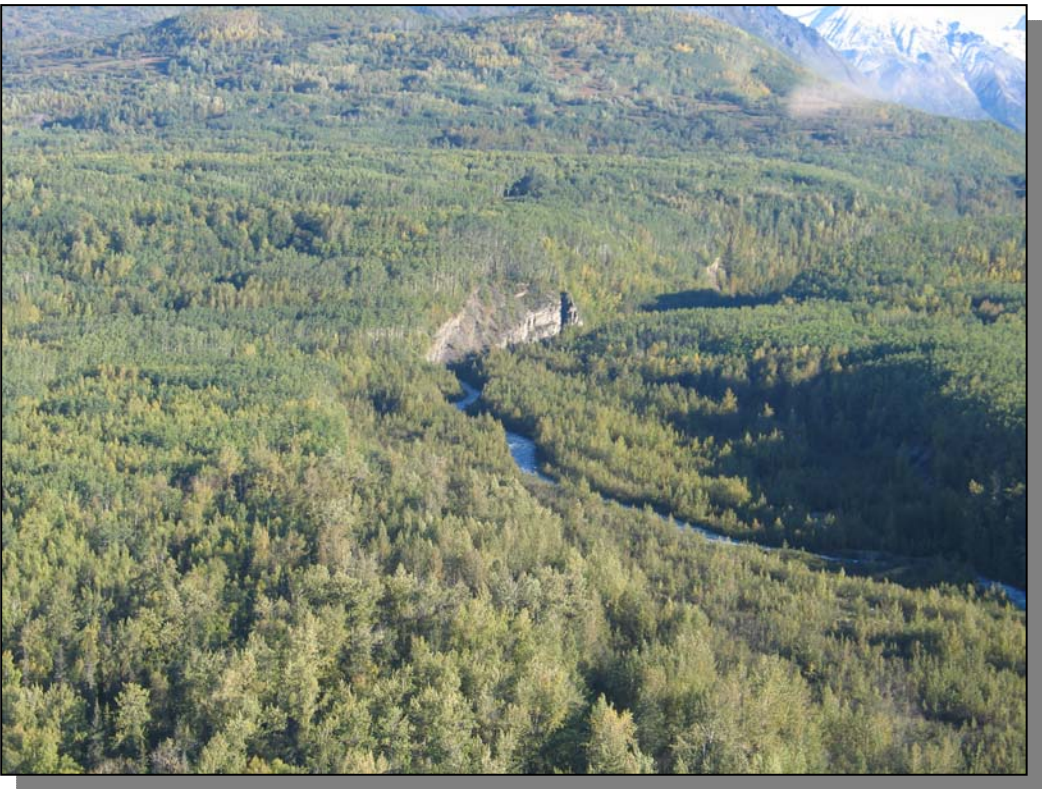


**Granite Creek**  
**Pipeline MP 126.01**  
**ADF&G Stream No. 247-50-10220-3015**  
**Site Visit: 9/2/05**

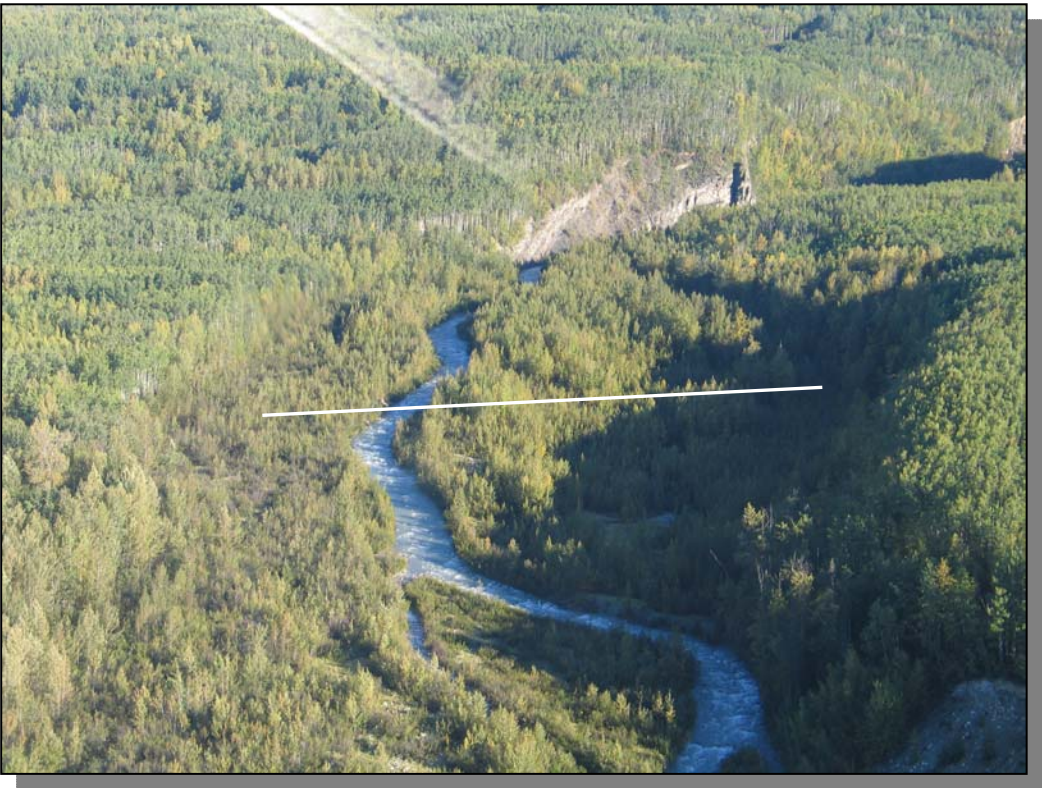
Crossing Description: Granite Creek is a high-gradient creek exhibiting straight stream channel characteristics. Within the immediate area of the pipeline crossing, topography is fairly gentle and the floodplain is three to four times the width of the creek.

Soils Description: Terrain unit mapping indicates that the left (east) bank soils grade from glacial till to colluvium overlying bedrock as the route approaches the stream bed. Right (west) bank and stream bed soils are anticipated to consist of granular alluvial fan deposits. The glacial till deposits are anticipated to generally consist of gravelly silty sand and gravelly sandy silt, both containing cobbles and boulders. The colluvium deposits are expected to consist of various mixtures of sand, silt and gravel containing cobbles and boulders with some organics. Alluvial fan deposits are anticipated to consist of gravel with sand and silt containing cobbles and boulders. Permafrost is not anticipated at this location.

Bedrock Description: Approximately one-quarter mile upstream of the crossing, a bedrock slope exposure is present (see photo). Depth to bedrock is unknown at the actual crossing location and vegetation cover precluded the observation of the remaining stream bed and stream banks during helicopter over-flight.



Approximate location of pipeline crossing, looking upstream.



White line indicates approximate location of pipeline crossing, looking upstream.  
Note bedrock exposure in upper center of photo.

**Soils Studies**

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**Natural Gas Pipeline**  
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**Eska Creek**  
**Pipeline MP 128.01**  
**ADF&G Stream No. 247-50-10220-2095**  
**Site Visit: 9/2/05**

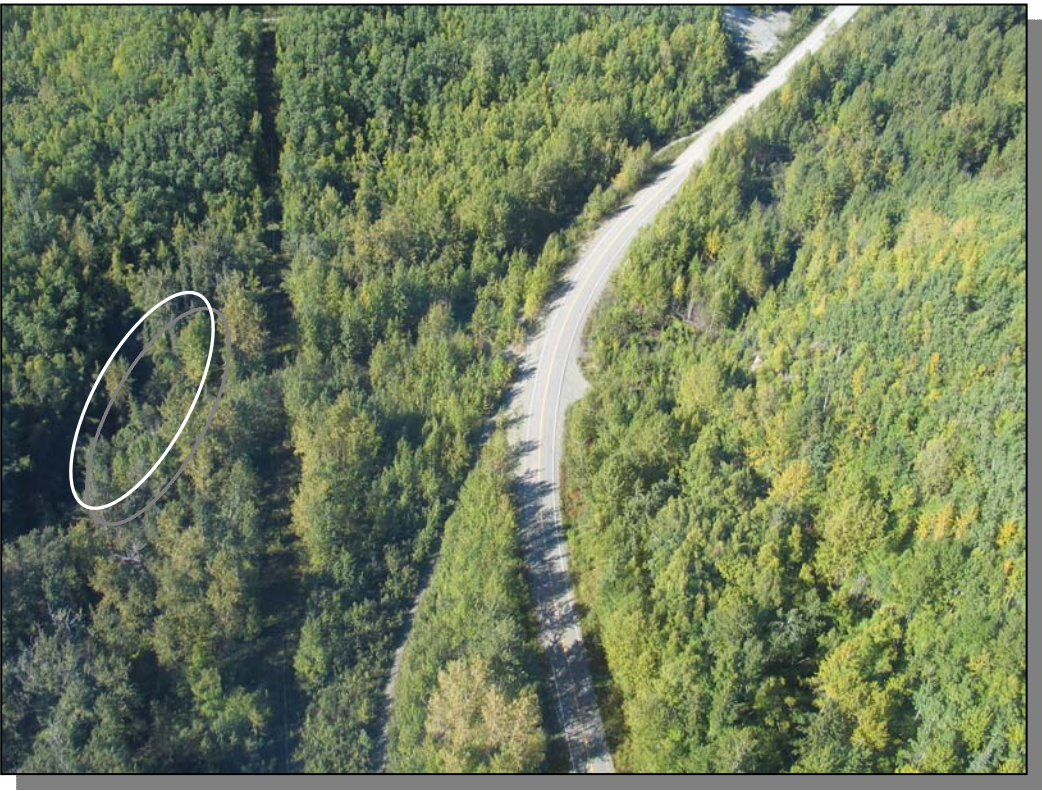
Crossing Description: In the vicinity of the pipeline crossing, vegetation was dense and observation of the stream bed was obscured. General topography indicates a high-gradient stream with straight stream bed channel. Relief on both banks appears fairly abrupt and the stream bed is anticipated to be located in a small V-shaped valley. Total width of the stream was observed to be less than about 10 feet.

Soils Description: Terrain unit mapping indicates that left (east) bank, streambed, and right (west) bank soils are granular alluvial fan deposits. These deposits generally consist of gravel with sand and some silt containing cobbles and boulders. As the crossing progresses up the west bank of Eska Creek, loess overlying an esker deposit is anticipated to be encountered. Permafrost is not anticipated at this crossing.

Bedrock Description: Depth to bedrock is unknown, and vegetation cover precluded the observation of the remaining stream bed and stream banks for bedrock exposures.



White oval indicates approximate location of Eska Creek crossing, facing upstream.  
Adjacent to Jonesville Mine Road.



As above.

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**Natural Gas Pipeline**  
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**Moose Creek**  
**Pipeline MP 134.32**  
**ADF&G Stream No. 247-50-10220-2085**  
**Site Visit: 9/2/05**

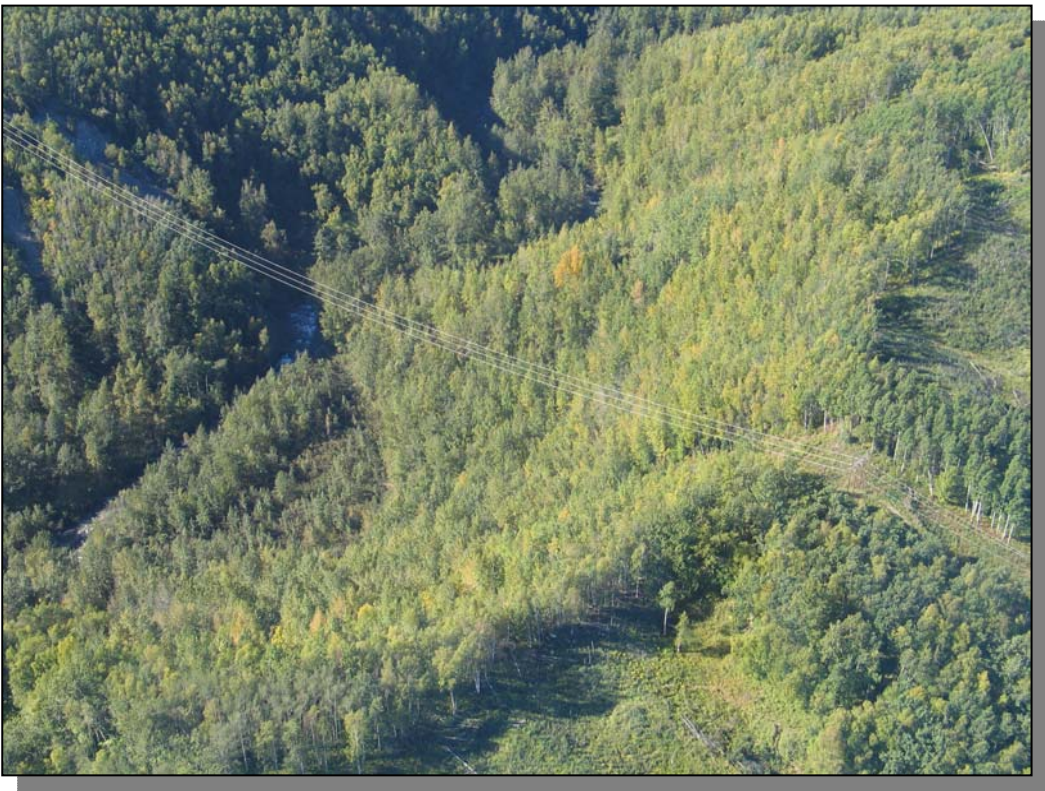
Crossing Description: Moose Creek is a high-gradient stream with meandering stream bed characteristics. Topographic relief of the pipeline crossing is approximately 100 vertical feet. Slope failures, both upstream and downstream, and on the right (west) bank along the alignment were observed. The immediate area of the proposed crossing is known as Tsadaka Canyon.

Soils Description: Terrain unit mapping indicates that along the highest elevations of each bank, the soils consist of loess overlying esker deposits. Along the walls of Tsadaka Canyon, colluvium overlying bedrock is expected, and along the floor of Moose Creek, floodplain deposits are anticipated. Permafrost is generally absent in this area.

Bedrock Description: Bedrock outcrops along the canyon; however, depth to bedrock at the crossing is unknown. Vegetation and colluvium cover precluded the observation of the stream bed and banks for bedrock exposures.



Proposed Moose Creek crossing is parallel with transmission lines, looking from right (west) bank.



Proposed crossing is parallel with transmission lines, looking from left (east) bank.

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**Carnegie Creek**  
**Pipeline MP 138.53**  
**ADF&G Stream No. 247-50-10260-2019-3076**  
**Site Visit: 9/2/05**

Crossing Description: Carnegie Creek is a low-gradient, meandering stream with an average width of less than about 20 feet. Dense vegetation in the form of spruce was prevalent in the vicinity of the proposed crossing.

Soils Description: Terrain unit mapping indicates that glaciofluvial outwash deposits consisting of gravel and sand containing cobbles and boulders are anticipated along the alignment crossing. Wind-blown silt (loess) is interpreted to overlie the glaciofluvial material. Permafrost is generally absent in this area.

Bedrock Description: Depth to bedrock is unknown; however surficial deposits are anticipated to be greater than 25 feet in depth within the immediate area of the crossing.



Overview of Carnegie Creek crossing. Stream flow is from top to bottom of photo.



As above.

**Soils Studies**

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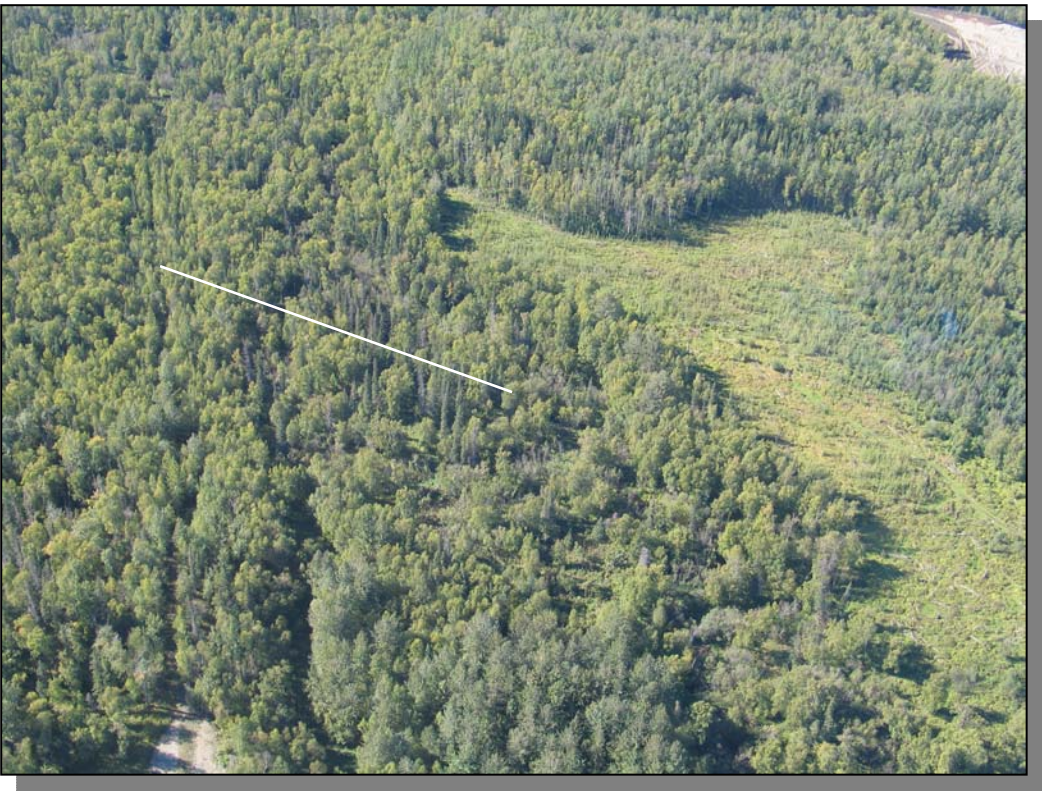


**Wasilla Creek**  
**Pipeline MP 144.6±**  
**ADF&G Stream No. 247-50-10260-2019**  
**Site Visit: 9/2/05**

Crossing Description: Wasilla Creek is a low-gradient, meandering stream with an average width of less than about 20 feet. Dense vegetation in the form of spruce was prevalent in the vicinity of the proposed crossing.

Soils Description: Terrain unit mapping indicates that glaciofluvial outwash deposits consisting of gravel and sand containing cobbles and boulders are anticipated along the alignment crossing. Wind-blown silt (loess) is interpreted to overlie the glaciofluvial materials. Permafrost is generally absent in this area.

Bedrock Description: Depth to bedrock is unknown; however surficial deposits are anticipated to be greater than 25 feet in depth within the immediate area of the crossing.



Overview of Wasilla Creek crossing; stream flow is from bottom to top.



Overview of Wasilla Creek crossing; stream flow is from right to left.

**Soils Studies**

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**Spring Creek**  
**Pipeline MP 147.24**  
**ADF&G Stream No. 247-50-10260-2019-3020**  
**Site Visit: 9/2/05**

Crossing Description: Spring Creek is a low-gradient, meandering stream with little topographic relief from bank to bank. Due to the absence of a confining stream channel, the width of Spring Creek is anticipated to fluctuate with the discharge volume. The pipeline is understood to cross west of the Parks/Glenn Interchange.

Soils Description: Terrain unit mapping indicates that organic deposits overlying and within marine estuarine deposits are the anticipated soil types to be encountered at this crossing. Organic deposits generally consist of decomposed and undecomposed organic material with some silt. The marine estuarine deposits generally consist of silt, sandy silt, and fine sand with some organic material. Permafrost is generally absent in this area.

Bedrock Description: No bedrock was observed and depth to bedrock is unknown. However, test borings for the new Parks/Glenn Interchange indicate that bedrock is greater than about 225 feet in depth.



Overview of Spring Creek crossing, stream flow is from bottom (east) to top (west) of photo.



Overview of Spring Creek crossing, stream flow is from top (east) to bottom (west) of photo.

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**Drawing No. B-21**